Habitat Restoration

Direct Seeding of Shrubs/Brambles on Reclaimed Mine Ground on Peabody Wildlife Management Area

Scott Harp and Eric Williams, KDFWR

The successful establishment of shrubs and/or brambles on mine reclamation sites is an important task because these habitats provide structure, cover, and foraging areas for many types of wildlife. Additionally, these areas often act as movement corridors for wildlife and may serve as important erosion control components of the landscape. Unfortunately, it is often costly and difficult to establish and maintain shrub/bramble habitats on reclaimed mining sites. Competition and domination of reclamation sites by Sericea lespedeza, *Lespedeza cuneata,* an aggressive invader of open areas, poses a considerable challenge when attempting to re-establish shrubs and brambles. Previous efforts to plant seedlings have not been successful; high mortality rates are usually present, making these efforts somewhat cost prohibitive. In 2007 we initiated a long-term study to assess success of direct seeding shrubs/brambles on reclaimed mine ground within Peabody Wildlife Management Area.

Through this study, we hope to address the following questions: 1) Will direct seeding of shrubs/brambles result in better survivability than planting seedlings? 2) Will developing shrubs out-complete sericea with only one year of control? 3) Will shrubs develop in a mixed-species situation or will one species out-compete the others? 4) Is direct seeding efficient when considering time and money involved when compared to planting seedlings? In an attempt to answer these questions, we created two test plots: a 0.76 acre plot where species were planted in monoculture stands to monitor individual development and a 0.66 acre plot where species were planted in a mixed-diversity stand to monitor mixed-diversity development. Seven species were planted: Silky Dogwood, Gray Dogwood, Smooth Sumac, Elderberry, Coralberry, Blackberry, and Wild Plum. To prepare sites for planting in August 2007, we sprayed plots with Garlon 3A and disked plots to bare ground. Plots were disked a second time and rocks were removed from plots during the first week in September and initial planting efforts began shortly thereafter. This is a long-term project which will continue until vegetation becomes established in each test plot such that we may evaluate the success of our direct seeding efforts. If direct seeding of shrubs/brambles proves to be effective, we hope to have this practice evaluated/approved by NRCS for potential inclusion in Farm Bill programs.

Eastern Kentucky reclaimed mine land/KDFWR

Funding Source: Pittman Robertson (PR)

Comprehensive Wildlife Conservation Strategy: Appendix 3.3, Priority Conservation Action #76.

Evaluation of Warm Season Grass Thinning Treatments on Green River Wildlife Management Area: Spring Disking, Glyphosate, and Select Herbicides

Brian Gray, KDFWR

Kentucky was once covered by about three million acres of native grasslands which were critical in supporting the large and diverse wildlife populations present in pre-settlement days. These native warm season grasses are bunch grasses which include switchgrass, big and little bluestem, indiangrass and side-oats grama. Unfortunately, these grasslands all but disappeared with the intensification and modernization of agriculture; as a result, most historically native grassland areas are now dominated by fescue. Since research shows that fescue provides very poor habitat for wildlife and can create problems for livestock, land managers are making efforts to re-establish warm season grasses in appropriate areas.

Switchgrass / Ben Robinson

Besides providing excellent year-round cover for small game and nutritious forage for livestock (6 -19% protein), native warm season grass stands, when appropriately managed, retain enough bare ground to allow gamebird chicks to move freely in search of food. Like all grasses, native warm season stands require periodic disturbance for stand maintenance; without this disturbances, stands become "rank" or extremely dense. Dense stands are of inferior quality to wildlife because they lack bare ground, making movement and foraging difficult for many types of wildlife. Historically, fire kept these stands of grasses from becoming rank; however, prescribed fire is not always feasible within the current landscape of Kentucky. As a result, we're exploring various treatments (e.g. spring disking, different types of herbicides) to thin warm season grasses on Green River WMA. Thus far, we have established 12 plots (11 treatment, 1 control) and treatments include: 2X, 4X, 6X or 10X spring disking, 3X and 5X fall disking, Glyphosate applications of 1.0 or 1.5 quarts per acre, and Select application of 12, 16, or 20 ounces per acre. We're currently collaborating with undergraduate students at Lindsay Wilson College to assess the vegetation attributes (grass and forb density and bare ground) on these study plots.

Funding Source: Pittman-Robertson (PR)

Comprehensive Wildlife Conservation Strategy: Appendix 3.3, Priority Conservation Action #76.

Grassland Management and Restoration in Kentucky

John Morgan and Ben Robinson, KDFWR; David Howell, Quail Unlimited; Jeff Sole, The Nature Conservancy

Prescribed burn/Ben Robinson

Historically, there were approximately five million acres of native prairies, barrens, oak woodlands, and wet meadows in Kentucky. Grassland habitats, ranging from tallgrass prairie to oak savanna, supported rich wildlife and plant communities; however, less than one percent of Kentucky's total pre-colonial prairie habitat remains. Although five million acres of grasslands currently exist in Kentucky, these grasslands are characterized by exotic pasture grasses, low plant diversity and few ephemeral pools, and the resulting wildlife habitat is of low quality. To increase the quality of Kentucky's grassland habitats, we aimed to 1) re-introduce ephemeral pools to grassland habitats to benefit herpetofauna, and provide education to private landowners about the importance of ephemeral pools to wildlife and 2) create a management team to restore grassland habitat on private lands. Between July 2007 and June 2008, we anticipate completion of the following habitat modifications on private land: 2,000 acres of prescribed burns, installation of at least 25 ephemeral pools, conversion of 150 acres of fescue to native grassland habitat, and restoration of 100 acres of glade habitat. Kentucky Department of Fish and Wildlife Resources, Quail Unlimited, and The Nature Conservancy have formed a partnership to initiate these habitat modifications in 2007, and will continue working jointly to successfully restore grassland habitat throughout 2008.

Prescribed burn/ Brian Clark

Funding: Quail Unlimited**,** State and Tribal Wildlife Grant (SWG)

KDFWR Strategic Plan. Goal 1, Strategic Objective 2g. Comprehensive Wildlife Conservation Strategy: Appendix 3.3, Priority Conservation Actions #7, #14, #75, #76, #80, #88, #90, and #101.

Impacts of herbicide application following a late summer burn, KDFWR Headquarters

Brian Clark, Ben Robinson, John Brunjes, Dave Frederick, Chris Grasch, and Jim Barnard, KDFWR

Here at KDFWR headquarters, we are anecdotally gauging the impacts of Select herbicide (grass killer) on plants following a late summer prescribed burn. On September 18, 2007, a burn was conducted on the small field between the Wildlife Annex and the road that has been converted from fescue to native grasses and forbs. After re-growth of grasses to four to eight inches in height, the uphill half of this field was sprayed (early October) with Select herbicide (12 ounces per acre), while the downhill half was left untreated. We chose to use Select herbicide because this is a post-emergence herbicide designed to control grassy weeds, and has not yet been extensively tested for fescue-control in Kentucky. Suppression (temporary at least) of the grasses was visibly evident by winter. Presently, cool season grasses are very sparse on the treated (uphill) half of the plot, whereas they are populous on the lower portion (downhill half) of the plot. We plan to qualitatively assess the success of this treatment protocol in 2008.

Funding Source: Non-Federal Aid (NFA)

Comprehensive Wildlife Conservation Strategy: Appendix 3.3, Priority Conservation Action #76.

Prescribed burn/Brian Clark

Regrowth after burn/Brian Clark

Maximizing Wildlife Habitat and Cattle Productivity on T.N. Sullivan Wildlife Management Area

Danny Hughes and Terri Estes, KDFWR

Indian grass / Jacob Stewart

An interesting partnership has been evolving combining livestock and wildlife. Kentucky Department of Fish and Wildlife Resources has long understood the benefits of native warm season grasses or "buffalo grass", for species such as quail, rabbits and songbirds. Historically, "buffalo grasses" were located around many areas of the state and provided nesting, food, and cover for wildlife. Recently, steps have been taken to show the efficiency and profitability of these grasses in livestock grazing systems.

The T.N. Sullivan Wildlife Management Area located outside Frankfort, Kentucky serves as a demonstration farm to show best management practices for farming operations. On this farm, many practices are installed, one being native warm season grass pastures. Grasses that have been established are Eastern Gamagrass, Switchgrass, Big Bluestem and Indiangrass. Researchers and biologists want to look at livestock productivity, yield of particular forages and wildlife response. The goal is to give farmers the knowledge that cattle production can be maximized while providing quality wildlife habitat at the same time. This may seem an unlikely endeavor, but biologists realize the importance of farmers when it comes to managing wildlife. T. N. Sullivan Wildlife Management Area is readily accessible to local landowners, school groups, policy makers and researchers with the idea that we should provide answers to the public on the effectiveness and viability of the practices we are recommending.

Funding Source: Non-Federal Aid (NFA)

Comprehensive Wildlife Conservation Strategy: Appendix 3.3, Priority Conservation Action #76.

Mill Branch Stream Restoration Project, Knox County, Kentucky

Sunni Carr, KDFWR

The Blackside Dace (*Phoxinus cumberlandensis*) is a federally threatened cyprinid endemic to the upper Cumberland watershed, which includes eight Kentucky counties and three Tennessee counties. Population declines for this fish can be attributed to habitat degradation caused by dissolved metals associated with acid mine run-off, excessive sedimentation from poor logging and agricultural practices, and lack of a forested riparian canopy (causing increases in stream temperatures). In 2006, 77 Blackside Dace were collected in a 7,800 foot reach of Mill Branch Creek. Since the same length of "ideal" habitat should yield over 1,000 Blackside Dace, cooperative efforts (between state and federal agencies and, most importantly, private landowners) were initiated to plan restoration of this degraded stream channel. At present, restoration of approximately 4,200 feet of Mill Branch Creek is nearly completed. Accomplishments for 2007 include progress in the following areas: 1) engineering design and re-structuring of a new stream corridor, characterized by a meandering, not channelized stream system; 2) restoration of riparian vegetation and wetlands on adjacent streamside floodplains; 3) removal of Mill Branch Dam; 4) installation of a culvert to facilitate fish passage and provide Blackside Dace with a reliable pool of water during times of drought (thus preventing drought from causing local extinction of this fish in Mill Branch); and 5) use of natural structures (e.g. root balls, logs) to create favorable Blackside Dace habitat within the restored stream. With this portion of the project nearing completion, additional efforts to plan and fund restoration of the upper reaches of Mill Branch are currently underway, which will ultimately complete over one mile of stream for the Blackside Dace.

Before Restoration/Brent Harrell

After Restoration/Brent Harrell

Funding Source: Landowner Incentive Program (LIP) and Fees In Lieu of Mitigation (FILO)

Comprehensive Wildlife Conservation Strategy: Appendix 3.3, Priority Conservation Actions #120 and #164. KDFWR Strategic Plan. Goal 1, Strategic Objective Ie.

Native Warm Season Grass Suppression Treatments in Harrison County

Clay Smitson, KDFWR

Broomsedge/Ben Robinson

In an effort to thin a very rank (10-year old) stand of native grasses and goldenrod, I devised a set of 8 experimental herbicide treatments, and one untreated control, using several small (1/8 acre) test strips on a property in Harrison County. The entire area was burned on 3/07/06 to prepare for spraying on 5/17/06, when the grasses and high densities of goldenrod were actively growing. Very few forb species were found on the site. The herbicide and additive rates below are listed at their one acre rates, but were tank mixed to allow for the smaller strips. While no data was recorded, the results described below were visible in mid-August when first-year evaluations were completed.

- 6 ounces Select + 2 pints MSO
- 8 ounces Select + 2 pints MSO
- 10 ounces Select + 2 pints MSO

The results for these three strips were very similar, as all resulted in a substantial reduction of the number of native grass clumps and height. All plots retained a substantial amount of goldenrod, very similar to the control strip.

- 8 ounces Select + 6 ounces Plateau + 2 pints MSO
- 8 ounces Select + 10 ounces Plateau + 2 pints MSO

Approximately twice as many native grass clumps than on the first three strips were present, but with the same reduced height. These two strips experienced marginally better control of goldenrod.

- 32 ounces glyphosate (41% concentrate)
- 24 ounces glyphosate (41% concentrate)

No apparent effect on the numbers of grass clumps, but height was again greatly reduced. Again, marginally better control of goldendrod was achieved with these two treatments, and the grass was much shorter than in the control strip.

- 12 ounces glyphosate (41% concentrate)

No apparent effect on grass density or height, but virtually no broad-leaved plants were present in this strip.

These preliminary results seemed to indicate that unless higher glyphosate rates would produce better results, which needs further investigation, there may be no one treatment that successfully restarts these "late succession" native grass and forb sites. Possibly two herbicide treatments, one with Select, then a second to control goldenrod, and other tough broadleaves like sericea, might be effective.

Funding Source: Non-Federal Aid (NFA)

Comprehensive Wildlife Conservation Strategy: Appendix 3.3, Priority Conservation Action #76.

Quail Unlimited Warm Season Grass/Forb Test Plot Project on Kentucky River Wildlife Management Area

Scott Ferrell, KDFWR

Three different warm season grass/forb mixes provided by Quail Unlimited (QU) were test planted by KDFWR staff in the spring of 2004 on the Kentucky River Wildlife Management Area Gilbert Tract. Three, 2 acre test plots were selected and the planting sites were prepped by mowing the existing vegetation (mainly fescue), allowing the vegetation to actively begin growing again, then treating each test plot with a herbicide application using a tank mix of 1 quart Glyphosate/acre; 2 pints Methylated Seed Oil/acre; and a maximum of

QU Test Plot Number	Species In Mix
1	Kaw Big Bluestem, Aldous Little Bluestem, Cheyenne Indiangrass, Blackwell Switchgrass, Virginia Wildrye
2	Aldous Little Bluestem, Roundtree Big Bluestem, Blackwell Switchgrass, Rumsey Yellow Indiangrass, Riverbank Wildrye
3	Kaw Big Bluestem, Aldous Little Bluestem, Cheyenne Indiangrass, Blackwell Switchgrass, Canada Wildrye

4 ounces Plateau/acre (the recommended rate for these QU test plots). The initial kill of Vegetation provided good results on broadleaf plants, but showed only temporary control for fescue, which bounced back by fall. All three test plots consisted of a unique combination of warm season grasses and a different variety of wildrye; these plots were planted via no-till drill. (for species in each mix, see above table). All three test plots were also planted with the same mix of forbs consisting of the following species:

- Aztec Maximillian Sunflower
- Sabine Illinois Bundleflower
- Comanche Partridge Pea
- Blackeyed Susan
- Purple Prarie Clover
- Prairie Yellow Coneflower
- Plains Coreopsis

Forb species during the first growing season were slow getting established, but production of forbs has steadily increased each year thereafter. The wildrye growth has been thin and all varieties have shown very little production, while warm season grasses are present in all plots and intermixed with fescue. During test plot planting, warm season grasses were also planted adjacent to the test plots; however, these adjacent plots were sprayed using a rate of 8 oz. Plateau per acre. The areas sprayed with 8 oz. Plateau per acre, when compared to the 4 oz. per acre application on test plots, were characterized by a dramatic difference in vegetation kill and significant decrease in the amount of returning fescue. 6 – 8 oz. of Plateau per acre applied to test plots, instead of 4 oz. per acre, would have likely resulted in better establishment of wildrye and warm season grasses.

Maintenance of the test plots has included annual strip mowing and a fall (late August) prescribed burn of test plots No. 2 and 3 in year 2006 and test plot No. 1 in year 2007 to stimulate/increase forb production. We plan to continue monitoring these test plots throughout 2008 to assess success/failure of warm season grass and forb establishment.

Funding Source: Quail Unlimited**,** Pittman Robertson (PR)

Comprehensive Wildlife Conservation Strategy: Appendix 3.3, Priority Conservation Action #76. KDFWR Strategic Plan. Goal 1, Strategic Objective 2.

Shorebird Management Unit Creation and Invasive Willow Control

John Brunjes, KDFWR

SMU in Ballard County/John Brunjes

The loss and degradation of stopover sites used during migration is a suspected cause of widespread population declines documented in North American shorebirds. These stopover sites provide important sources of food and areas of rest during migration, and more than twenty species of shorebirds use shallow water habitats in Kentucky as stopover sites. The encroachment of woody vegetation into wetland areas poses one of the largest threats to Kentucky's existing stopover habitat; specifically, unmanaged stands of willow (*Salix sp*.) alter hydroperiods and result in areas unsuitable for shorebirds. In 2007, we used mechanical techniques to convert unmanaged stands of *Salix sp*. into twelve shallow water impoundments for use as Shorebird Management Units (SMUs) in Ballard County, Kentucky. We began monitoring shorebird and waterbird use of these new SMUs in the fall of 2007, and we plan to continue monitoring these areas in 2008 to increase our knowledge of the species composition and timing of shorebird migration in Kentucky. In the upcoming year, we will dedicate continued efforts toward *Salix sp*. control (herbicide treatments) to prevent early successional woody growth and to allow shallow-water vegetation to become established in these newly created SMUs.

Funding Source: State and Tribal Wildlife Grant (SWG)

Comprehensive Wildlife Conservation Strategy: Appendix 3.3, Priority Conservation Actions 156 and 186.

Wildlife Damage

Use of Temporary Electric Fencing to Eliminate Deer Damage to Sunflower Plantings on the Blue Grass Army Depot

Tom Edwards, KDFWR

Deer exclusion fence/Tom Edwards

The Blue Grass Army Depot (BGAD), which occupies a 15,000 acre area, has average summer deer densities of 1 per 12 acres. In the past, these high deer densities have limited dove field crop options. For example, in 2004, the planting of sunflowers without an electric fence resulted in the total destruction of the sunflower crop from deer foraging. Beginning in 2006, we began using parallel electric fences, sometimes referred to as "3-wire New Hampshire" fences to deter deer from dove fields. This fence design is powered by a 3-mile solar fence charger and is characterized by two strands of electric fencing placed six feet apart. Fence wire was 7/8" wide "equine polytape ribbon" supported by permanent corner posts and 38" temporary posts on 20' spacing. Both the upper and lower electric ribbons on the outer fence were "hot." To prevent deer from jumping both strands of fence, this original design was modified by placing an additional strand of electric fence in a staggered pattern between the inner and outer fences. We found that this electric fence design is 100% effective for preventing deer damage to sunflower crops. Since 2006, we have employed this fencing design which, at a cost of approximately $0.50 per linear foot (excluding cost of fence charger), is an inexpensive and effective means of controlling deer damage to relatively small sunflower fields.

Funding Source: Non-Federal Aid (NFA)

KDFWR Strategic Plan. Goal 1, Objective 5.